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ABSTRACT

This study of effective teaching behaviors focused on small group instruction of young children in beginning reading skills. Ten first grade teachers used an instructional model which emphasized individual questioning of students, systematic selection of students for oral reading, and sustained feedback from the teacher to the individual student. Teacher-student interactions were observed during two lesson formats: questions and answers and oral or silent reading for content. Patterns emerging from the interactions are analyzed and interpreted in light of other teacher effectiveness research. It was observed that applying the principles outlined in the instructional model improved the pace of the reading sessions and minimized distractions and interruptions. (JD)

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An Examination of Classroom Context: Effects of Lesson Format and Teacher Training on Patterns of Teacher-student Contacts During Small Group Instruction

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Abstract

Understanding the influence of classroom contexts is essential for the study of teaching. This report presents an analysis of data from an experimental study of teaching effectiveness in which two components of teacher-student contacts (methods of selection and teacher feedback to student's errors) were examined for the effects of lesson format and teacher training. Results indicated that both the format and the experimental treatment affected the teachers and frequently an interaction was present. Results are discussed in terms of lesson pacing that seems most appropriate for different objectives and how pacing may influence teachers' instructional decisions during a lesson.

An Examination of Classroom Context:

Effects of Lesson Format and Teacher Training on Patterns of

Teacher-student Contacts During Small Group Instruction

Researchers of classroom processes and of teachers' effects on student learning have maintained that "context" must be considered in the interpretation of classroom data (Brophy & Evertson, 1978; Dunkin & Biddle, 1974; Good & Brophy, 1977; Good & Power, 1976; Tikunoff, Note 1; Ward, Note 2). Hence, important tasks for classroom researchers are to define those dimensions on which classrooms, teachers, students, and activities may vary, and to describe ways in which contextual variables influence relationships between and among classroom processes and student outcomes.

Such efforts are necessary to adequately describe the correlates of effective teaching, since the appropriateness of any set of teaching behaviors depends on the purposes and constraints of the setting, which may be characterized in a variety of ways (e.g., the age, ability, and background of students, lesson objectives, size of group, type of classroom, time of day, and time of year). An understanding of contextual influences on teaching is also necessary for the study of teacher decisions, since teachers consider the demands of particular settings when choosing among alternative strategies.

Typically, contextual variables have been examined on a molar level. For example, students' SES, entering achievement level, and age have been shown to be important factors in describing relationships between observed behaviors and achievement (Brophy & Evertson, 1976, 1978; Good, Ebmeier, & Beckerman, 1978; Soli & Devine, 1976). Other

descriptors of settings that have been used in classroom research include group size, subject matter, and grade level (e.g., see McDonald and Elias, Note 3, and Stallings and Kaskowitz, Note 4). Some researchers have suggested ways to think about classroom contexts by organizing important dimensions according to various schemes (e.g., Good and Power, 1976; Tikunoff, Note 1).

Such organizational schemes help to reduce the complexity of the questions generated when one acknowledges the importance of "context" and they suggest several directions for research in this area. However, despite the conceptualization that has been done, most of the research describing contextual effects on classroom processes has included only variables at a molar level, especially when setting characteristics are considered. A more detailed investigation of student variables has occurred in recent years, possibly because of the more developed field of the psychology of individual differences. As Shulman (1970) pointed out nearly a decade ago, we need to supplement our knowledge of individual characteristics with more complex understandings of environments and settings, especially of the tasks (i.e., mental operations) that occur in them.

The present paper provides data on classroom settings on a more molecular level than has been typical of classroom interaction research in the past. The data reported here were collected within a setting that has not usually been further differentiated: small group instruction of young children in beginning reading skills. Even within this circumscribed setting, contextual influences on teacher behaviors could be documented.

The data describe the effects on teacher-student interactions of two types of lesson formats commonly used in primary reading instruction in small groups. The data were collected as part of an experimental study of teaching effectiveness, and so treatment effects are also examined (i. e, differences between treatment and control teachers). Therefore, there is information about the effects of lesson format, intervention efforts, and the interaction of the two on patterns of teacher-student contacts.

Background and Methodology

The First-grade Reading Group Study was an experimental effort based on an instructional model consisting of 22 specific principles believed to promote effective teaching of young children in small groups. The model was presented to 10 first-grade teachers who agreed to implement it in their reading group instruction. Ten other teachers served as a control group and received no special treatment. All teachers were observed teaching their reading groups 15 to 20 times during the year.

The principles in the instructional model covered a wide range of teacher behaviors, but the data describing the teachers' contacts with single students are discussed in this paper. During observations, each academic contact between the teacher and a student was described according to the type of selection, question, answer, and feedback.

The suggestions made in the treatment that are pertinent to the data given in this paper were the following:

1. Ask questions to individual students, making sure that everyone has a chance to practice skills and receive feedback.

2. Select students systematically by going around the group in order. Do not rely on random selection or on volunteers. Minimize calling out by students before the teacher has selected someone to answer.

3. When a student has failed to respond to a question or has answered incorrectly, the teacher should either give the answer, or, if the question and pace allow, use sustaining feedback (i.e., stay with the student and give clues or simpler questions to help the student improve the answer). Do not ask other students to supply the answer.

The following categories and terms will be used to describe the teacher and student behaviors involved in using these principles:

Contact. An interaction between the teacher and an individual student in the group about academic content. Two types of contacts were described: reading turns and brief contacts.

Reading turns were noted when a student was asked to read a passage from the basal reader, to read a list of words, or to read a sentence from the board. Therefore, a reading turn was an extended contact. Within a reading turn, there could be brief contacts about single words whenever a student misread or could not read them.

Brief contacts were noted whenever the teacher and child interacted about a single word or short question. Two components of short contacts are discussed in this article: selection and feedback.

Selection Variables

Ordered turns. The teacher selected students on the basis of their position, going around the group in order.

Volunteer. The teacher selected a student who had indicated a desire to answer the question.

Call out. A student answered a question by shouting out the answer before the teacher indicated who should respond.

Feedback Variables

Terminal feedback. The teacher's response to an incorrect answer (or a student's failure to respond to the question) was to supply the answer in some way, thus terminating the student's opportunity to answer that question.

Sustaining feedback. The teacher's response to an incorrect answer or failure to respond was to stay with the student without providing the answer directly. Instead, the teacher offered clues or simplifying questions, thus sustaining the student's opportunity to answer that question. Analyses of all data from the study are reported in Anderson, Evertson, and Brophy (1979, Note 5). The present report is based on part of the total data base: It includes only those contacts that occurred during two common lesson formats that accounted for about 60% of the total instructional time. These were:

1. Question/Answer format. The students did not have individual materials; instead, attention was supposed to be focused on the teacher, who was presenting information and asking questions. She may have used materials as the central focus (e.g., flannel board displays, posters, pictures). The main activity of this format was teacher-student contacts about short questions and single words. When reading turns were recorded in this format, they usually represented sentences or a list of words read from a central display. Acceptable student activities were listening to the teacher, answering orally, or listening to other students answer. This format did not include written work in workbooks, even when done as a group activity. Typically, the purpose

of this format was presentation and practice of decoding skills, with little emphasis on comprehension.

2. Reader format. Each student had a copy of the basal reader, and attention was supposed to be focused on reading a story from the book orally or silently, listening to others read aloud, and answering questions about the content of stories. The objective of this format was usually the application of several reading skills to a story for the purpose of comprehension. Typically, reading turns noted in this format were longer than those in the Question/Answer format, usually consisting of at least two sentences and sometimes several paragraphs.

The treatment did not discuss lesson formats. As expected, then, there were no significant differences in time spent in the formats by the treatment and control groups. On the average, treatment teachers spent 25% of lesson time in the Question/Answer format and 40% in the Reader format. For teachers in the control group, the averages were 24% and 37%. An analysis of variance revealed no significant differences in these scores for the two groups of teachers.

Data Analyses

All contacts that occurred during these two formats were tallied by teacher, according to the categories described above. Variables were created as either rates (expressed as occurrences per time) or percentages (expressed as the relative frequency of all possible occurrences).

A 2 X 2 between-within analysis of variance was performed on several classroom process variables. The variables reported in Table 1 were selected because they yielded both statistically and practically significant results. The study included over 500 rate and proportion

variables, which could all be examined within five observed lesson contexts. After reviewing the data, the authors concluded that the results presented below were sufficient to demonstrate the usefulness of this level of contextual analysis. The selectivity was not intended to obscure other patterns of results, but rather to highlight the most salient patterns.

Significant treatment effects indicated that, on the whole, the teachers who received the treatment acted differently than the control teachers. Significant format effects indicated that the frequency of classroom process variables was different in the two formats. Significant interactions between treatment group membership and lesson format indicated that the differences between the two groups of teachers depended on the particular lesson format in which they were observed, or that the observed differences between formats depended on the treatment group assignment of the teachers.

Results

Rate of Contacts with the Teacher (Variables 1 and 2)

There was a significant interaction between treatment and format for total contacts (1): There was a greater difference between formats for the treatment teachers than the control teachers, who had a similar number of contacts in each format. For both variables, format and treatment effects were present. There were more contacts in the Question/Answer format, and treatment teachers had more contacts with their students.

Selection of Students to Answer Questions (Variables 3-6)

There were treatment effects present for all selection variables, as expected. The lesson format did not strongly influence the teacher's

choice of selection strategies, although there were two results that were weakly significant: Teachers were more likely to call on students who had not volunteered in the Reader format than in the Question/Answer format (4). Correspondingly, they called on volunteers more often in the Question/Answer format (5). There are two possible explanations for these results. First, teachers sometimes call on nonvolunteers to control student attention. By calling on students who have not been paying attention, teachers may encourage all students to be more attentive. In the Reader format, there may be a greater need of such attentional monitoring than in the Question/Answer format, because the time between each child's turn is longer, and students may become distracted more easily. A second possible explanation is that teachers are more aware of equitable distribution of contacts when a story is being read aloud in the Reader format. Therefore, they may more often deliberately call on someone who has not indicated a desire to read or respond. In the Question/Answer format, the teacher may be less aware of or less concerned with everyone responding to questions. This format is usually more quickly paced, and reliance on volunteers may help to maintain this pace.

The last type of selection is more student-controlled than teacher-controlled: students calling out the answer. When only brief contacts not occurring within reading turns were considered, there were significant treatment, format, and interaction effects (6). Treatment teachers had fewer call outs overall (as expected), and there were more call outs in the Reader format than the Question/Answer format. (In the Reader format, short questions that were not during reading turns were likely to be comprehension questions about the story

that had just been read.) Treatment teachers had similar rates of call outs in each format; however, control teachers had more call outs in the Reader format. It might be that questions about the story in the Reader format were more interesting to the students or were asked in a way that encouraged call outs. Perhaps teachers find call outs less of a management problem in this situation, and may even encourage them in order to generate enthusiasm. If so, control teachers, might have allowed more of them in the Reader format. Treatment teachers, on the other hand, were apparently influenced by the instructional model and were discouraging call outs in both formats.

Teacher Feedback to Students' Answers (Variables 7 through 17)

Results for these variables reflect a constraint on the choice of sustaining feedback: It usually takes longer than terminal feedback. When it is important to maintain a rapid pace, sustaining feedback may not be appropriate. This point was made in the treatment materials, and treatment teachers were encouraged to make decisions about feedback on the basis of several contextual factors, including lesson pace. However, the treatment encouraged the use of sustaining feedback whenever it was appropriate.

Overall, treatment teachers were more likely to use sustaining feedback and less likely to use terminal feedback. There was more use of terminal feedback in the Reader format than the Question/Answer format by both treatment and control teachers, especially for contacts involving misread words in reading turns (7-15). This makes sense when one considers the pacing requirements of oral reading turns. The purpose is not only to call words correctly, but also (and more importantly) to gain meaning from the reading. To do so requires that a

certain pace be maintained. Stopping frequently to provide sustaining feedback to miscalled words would destroy this pace.

Apparently, the treatment teachers followed the suggestions in the treatment to select feedback strategies according to lesson pace: they used greater amounts of terminal feedback, especially by giving the answer (Variables 10 and 13), in situations where this was more appropriate (the Reader format). However, treatment teachers' use of sustaining feedback was greater than the control teachers in slower-paced lessons. In contrast, the control teachers had comparable rates of terminal feedback within each format, regardless of whether or not contacts occurred during faster-paced reading turns. These data suggest that the treatment did influence the treatment teachers' behaviors in ways that were not incongruent with the pacing demands of the lesson.

Another component of the treatment discouraged the teacher from asking other students for the answer when a first student has answered incorrectly. There was a treatment effect here (treatment teachers did this less) as well as format and interaction effects. Control teachers asked other students for corrections more in the Question/Answer format and less in the Reader format, although treatment teachers had similar (low) rates of use in the two formats (11,14). The differences in the control teachers' behaviors make sense when pacing requirements are considered. In the Question/Answer format, contacts usually moved at a slower pace; therefore, the extra time required to ask another student to answer (rather than the teacher quickly giving the answer) probably did not impose a constraint. In the Reader format, where contacts occurred during reading turns, asking another student for the answer

might have slowed down the pace too much and destroyed the continuity of the passage.

Discussion

The most important pattern evident in these data is the combined influence of the treatment and the format. The instructional model did influence the treatment teachers' behaviors, but not in an arbitrary way. The format differences suggest that the treatment teachers were applying the principles of the model in ways that seemed most appropriate, given the constraints and demands of the particular setting.

The data presented here do not imply anything about what teacher behaviors are more or less effective, but the results have been interpreted in light of other research on teaching effectiveness. Data have suggested that more effective teachers, especially in the earlier grades, are able to maintain a steady, interesting pace in their lessons and to prevent many distractions and interruptions (Brophy & Evertson, 1976; Kounin, 1970). Therefore, it has been assumed that many teachers' "on-the-spot" instructional decisions (such as choice of feedback strategies) are determined to a large extent by the need to maintain the most appropriate pace for the lesson.

As discussed here, pacing is an important consideration, not only because it facilitates getting and maintaining students' attention and preventing distractions, but also because it may contribute to the performance of the academic tasks. One example of this was the more frequent use of rapid feedback when words were read incorrectly during reading turns, where the instructional purpose is to comprehend the passage--to string together the meaning of each single word and

understand their collective meaning. More rapid feedback helps maintain a more rapid pace, which is essential if the young readers are not to lose their train of thought. Therefore, the pacing is related to the cognitive demands of the task.

In contrast, consider lessons in which new skills are being presented and initial practice opportunities offered. Such lessons occurred during the Question/Answer format. Here, students' processing may be facilitated if the pace is not too fast, so that relevant information may be highlighted. Questions asked to students usually do not require that they hold in memory as long a sequence of information as is necessary in reading a passage, so that longer feedback will not interfere with immediate instructional goals.

Data to support these hypothesized uses of pacing are provided by other analyses of the same data base, reported in Anderson, et al. (Note 5). Although those results were not broken down by lesson format, contacts were separated according to occurrence within reading turns or outside of reading turns. Variables describing error rate and types of feedback to errors were examined for their relationship to student achievement. For reading turns, the data suggested that more effective teachers offered easier turns, so that there were fewer mistakes. However, there were few significant relationships with achievement for types of feedback to errors during reading turns, suggesting that one technique was not clearly superior to another, although most teachers relied on more rapid (terminal) feedback. However, for short questions asked outside of reading turns, the error rate was less important (i.e., not strongly related to achievement) but the type of feedback was more important. (More effective teachers used relatively more sustaining

feedback to errors.) Apparently, in assigning an oral reading passage for the purpose of comprehension, it is most important to prevent errors that will slow down the passage. However, with shorter questions, when the purpose is often the introduction and practice of new skills, errors may be very useful in helping the teacher diagnose the need for reteaching, which apparently was done frequently by the more effective teacher through sustaining feedback immediately following an error. Therefore, in one case, preventing errors was more important than the response to them. In the other case, the opposite was true.

The data reported in this article and reported in Anderson et al., (Note 5) demonstrate that micro-level analyses of lesson context have payoff for the study of teacher decision making, the study of the correlates of student achievement, and the study of teacher cnahge following intervention efforts. These data were completely observational, and were limited to only one aspect of classroom context. Obviously, this line of investigation would also benefit from other types of inquiry, especially a more clinical examination of teachers' understandings of and reasoning about the contexts of the classroom.

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Table 1

Results of Analyses of Teacher-student Contact Variables

by Teacher Group and Lesson Format

Variable	Teacher Group	Means and Standard Deviations[1] Question/ Answer Format	Reader Format	Probability Levels of Effects[2] Treatment group	Context	Interaction
Rate of Contacts with the Teacher						
1. Contacts per minute (Total of contacts during reading turns and outside of reading turns)	Treatment	2.82 (.37)	2.19 (.34)	< .01	< .01	.01
	Control	2.05 (.46)	1.91 (.31)			
2. Contacts per minute that were not during reading turns	Treatment	2.42 (.47)	1.39 (.26)	< .01	< .01	ns
	Control	1.86 (.44)	.86 (.28)			
Selections of Students to Answer Questions						
3. Percent of questions selected by ordered turns	Treatment	.72 (.15)	.70 (.17)	< .01	ns	ns
	Control	.21 (.15)	18 (19)			
4. Percent of questions asked to students who did not volunteer	Treatment	.10 (6)	12 (7)	< .01	.10	ns
	Control	2.9 (.10)	36 (14)			
5. Percent of questions asked to volunteers	Treatment	6 (9)	2 (3)	.01	.09	ns
	Control	25 (24)	18 (14)			
6. Percent of questions outside of reading turns that were answered by students calling out	Treatment	7 (9)	8 (5)	.01	.01	.01
	Control	13 (9)	31 (21)			

[1] Standard deviations appear in parentheses.

[2] ns Indicates that the probability of the F-ratio was greater than .10.

Table 1-Continued

Variable	Teacher Group	Means and Standard Deviations[1] Question/ Answer Format	Reader Format	Probability Levels of Effects[2] Treatment group	Context	Interaction
Teacher Feedback to Students' Answers						
7. Percent of all incorrect answers that received terminal feedback instead of sustaining feedback	Treatment	35 (9)	49 (10)	< .01	< .01	ns
	Control	46 (11)	69 (15)			
8. Percent of misread words during reading turns that received terminal feedback instead of sustaining feedback	Treatment	43 (23)	59 (18)	ns	< .01	ns
	Control	46 (27)	66 (21)			
9. Percent of incorrect answers to questions outside of reading turns that received terminal feedback instead of sustaining feedback	Treatment	34 (7)	38 (13)	< .01	< .01	.06
	Control	48 (9)	63 (12)			
10. Percent of all incorrect answers to which the teacher gave the answer	Treatment	23 (6)	36 (13)	ns	< .01	.03
	Control	12 (8)	48 (23)			
11. Percent of all incorrect answers after which the teacher asked another student	Treatment	8 (5)	8 (5)	< .01	< .01	< .01
	Control	27 (12)	11 (6)			
12. Percent of all incorrect answers to which the teacher supplied a clue	Treatment	39 (11)	27 (13)	< .01	< .01	ns
	Control	24 (11)	13 (7)			
13. Percent of all student failures to respond to which the teacher gave the answer	Treatment	23 (10)	36 (12)	ns	< .01	.02
	Control	13 (18)	51 (26)			

[1] Standard deviations appear in parentheses.

[2] ns Indicates that the probability of the F-ratio was greater than .10.

Table 1-Continued

Variable	Teacher Group	Means and Standard Deviations[1] Question/ Answer Format	Means and Standard Deviations[1] Reader Format	Probability Levels of Effects[2] Treatment group	Probability Levels of Effects[2] Context	Probability Levels of Effects[2] Interaction
14. Percent of all student failures to respond after which the teacher asked another student	Treatment	8 (7)	9 (5)	.02	.07	.06
	Control	27 (19)	15 (14)			
15. Percent of all student failures to respond to which the teacher supplied a clue	Treatment	41 (16)	32 (9)	< .01	< .01	ns
	Control	24 (15)	14 (7)			

[1] Standard deviations appear in parentheses.

[2] ns Indicates that the probability of the F-ratio was greater than .10.